



**Real Application of
Transformative Approaches for**

Teaching and Learning in the 21st Century

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Special Dedication

This book is dedicated to UNIMAS academicians who work hard in conducting the best teaching and learning experience. This book is hoped to be an inspiration to educators on how to implement the teaching and learning process more effectively.

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Preface

“It’s not just learning that’s important. It’s learning what to do with what you learn and learning why you learn things that matter.” -Norton Juster

The Real Application of Transformative Approaches for Teaching and Learning in the 21st Century book was produced to appreciate the transformative work of lecturers in teaching and learning. This book is expected to serve as a guide to other lecturers in helping them to improve their teaching approach, delivery, and assessment of their courses. Lecturers can also use this book to develop their ideas and creativity in designing teaching and learning according to current needs and align with the learning outcomes of the course.

Global changes in the twenty-first century have altered the landscape of teaching and learning, particularly in delivery methods, approaches, and assessments. This is due to the fact that the student body is made up of generation Z, who have different styles of learning than that of the lecturers. Conventional methods used by lecturers are no longer an option for today’s students. Therefore, lecturers must transform their teaching and learning in order to be relevant to today’s students.

The combination of transformative approaches introduced becomes the strength of this book's content. Authors combine diverse approaches, delivery, and assessment in teaching to ensure the effectiveness of teaching to students. Moreover, the collaborative approach used provides an alternative for lecturers to minimize the burden on students for courses taken. This approach has the potential to have a greater impact, particularly in terms of student understanding of learning.

The element of creativity incorporated is also a strength of this book. Authors explain some terms and concepts using diagrams and figures to help the reader understand. The steps and procedures for carrying out teaching and transformative approaches are stated in a systematic manner to help the reader understand what is being conveyed.

The book also includes writers from various backgrounds. This distinguishes it as a unique and comprehensive manuscript. Readers are guided through conceptual and practical understanding of teaching and learning methods. The author's presentation of basic concepts and applications can help the reader understand knowledge more deeply and broadly.

Crafting a learning environment where students are able to explore and understand how the physical world works, and to connect complex scientific concepts to their daily lives is vital. It also includes building students' confidence in their ability to solve challenging problems and empowering them to build a better future for themselves and others. CTS is one of a better way of learning that will prepare students towards focusing on being very collaborative, self-motivated and self-directed all the time staying true to the lifelong learning values, which are imperative to carve a better future for the students in their field of choice.

The next project is related to the environmental issues relating to solid waste, wastewater, and hazardous waste viewed in the context of their treatments. This course has been implementing service learning (SULAM) as a part of an immersive learning approach since Semester 2, 2017/2018. In the previous years, i.e. 2017/2018, and 2018/2019, the

course assessment included either a final examination (40%, session 2017/2018), or a mid-term examination (30%, session 2018/2019). Although SULAM implementation in this course has generally improved the CLO achievement since 2017/2018, the pen and paper examination has resulted in some students not achieving the intended CLOs. Instructors were not sure on the effectiveness of examination in creating a deep learning experience for students.

Therefore, in semester 2, 2019/2020, mid-term examination was replaced with case-study analysis to (1) encourage higher order thinking skills among students and (2) cultivate the sense of commitment and responsibility among students to find innovative solutions towards waste management issues. In addition, students' e- SULAM projects as well as group discussion and engagement with target community were implemented on online platforms. Students' reflection on their e-SULAM projects was recorded on their e-portfolio. Implementation of immersive learning through blended learning in this course has resulted in improved CLO achievement as compared to the past two years. Students' reflection on their learning experience in this course implied the effectiveness of immersive learning (blended learning) approach in this course.

Besides that, the project involved transforming the typical class lecture into an interactive scientific communication environment. Students were exposed to the real scientific communication via workshop-style delivery, project-oriented problem-based learning (PoPBL) on proposal writing projects, and brainstorming/discussion activities during weekly meetings. The initiative eliminated the traditional lecture and end-of-semester assignment practices.

Another project is MATHX Project, a new project-based learning instrument that allows digital students to work collaboratively, purposely implemented to develop teamwork and student's management skills. Students translated acquired knowledge to applications and STEM projects. The integration of digital technology used in this project helps students create meaningful and enjoyable learning experiences in Mathematics.

The following project is related to the assessment in learning. In order to improve learning via assessment conduct, assessment must be objective, significant, and magnitude. OSPE has/have been adapted and implemented for Biology students in Centre for Pre-University Studies to assess know-what and know-how practical competencies following the objective and structured manner with direct observation of the students' performance. The assessment provides meaningful learning experience to the students as it can assess all three domains (cognitive, affective, and psychomotor).

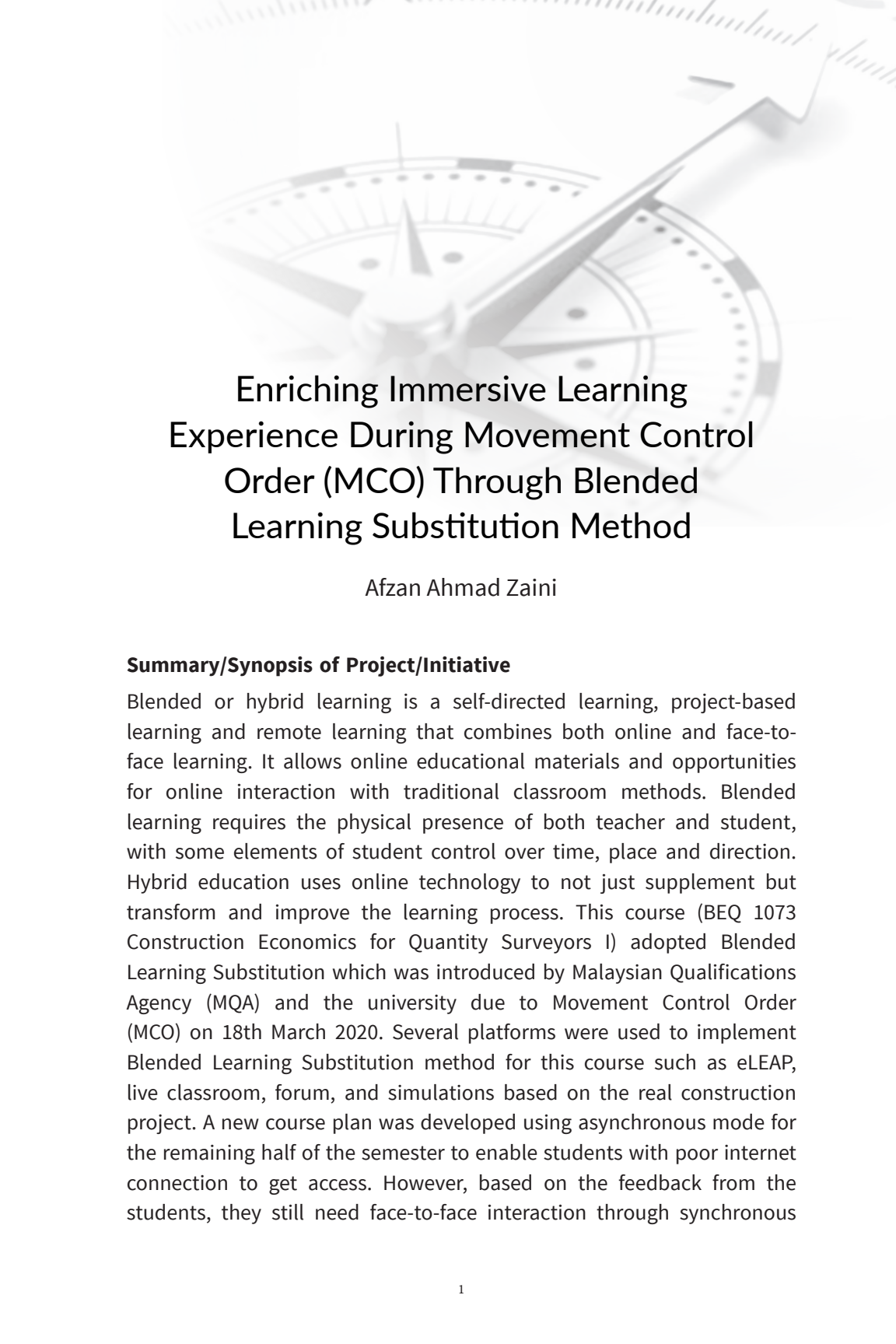
Furthermore, the enriching immersive learning experience during movement control order (MCO) was possible through blended learning substitution method. Finally, one project is related to social media and animation software offering several attractive features that may overcome the limitations of the existing educational portals. The team introduced the use of YouTube, Instagram, and Doodly as supplementary platforms for teaching Environmental Biotechnology in Semester 2 2019/2020 which resulted in excellent academic performance and positive feedbacks from the students.

Finally, this book discussed also describe the course MDP30609 Community Medicine and Public Health posting, the assessment has been modified by adopting the Alternative Assessment method. The Alternative Assessment is regarded as comprehensive, where it assesses the candidates' ability to integrate writing task and performance, divergent thinking in solving problems and enhancement of meaning skills.

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First of all, we are very grateful to the Deputy Chancellor Prof Datuk Dr Mohamad Kadim bin Suaidi and Deputy Vice Chancellor (Academic and International) Professor Dr Ahmad Hata bin Rasit for their support and opportunity in producing this book. This gratitude also goes to the Director of CALM, Dr Kartini binti Abd Ghani for her encouragement throughout the journey of realizing this book. We would also like to extend our acknowledgments to the Deputy Directors (Teaching Advancement), (Learning Technology), Coordinators and all administrative staffs in CALM for the support.

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Enriching Immersive Learning Experience During Movement Control Order (MCO) Through Blended Learning Substitution Method

Afzan Ahmad Zaini

Summary/Synopsis of Project/Initiative

Blended or hybrid learning is a self-directed learning, project-based learning and remote learning that combines both online and face-to-face learning. It allows online educational materials and opportunities for online interaction with traditional classroom methods. Blended learning requires the physical presence of both teacher and student, with some elements of student control over time, place and direction. Hybrid education uses online technology to not just supplement but transform and improve the learning process. This course (BEQ 1073 Construction Economics for Quantity Surveyors I) adopted Blended Learning Substitution which was introduced by Malaysian Qualifications Agency (MQA) and the university due to Movement Control Order (MCO) on 18th March 2020. Several platforms were used to implement Blended Learning Substitution method for this course such as eLEAP, live classroom, forum, and simulations based on the real construction project. A new course plan was developed using asynchronous mode for the remaining half of the semester to enable students with poor internet connection to get access. However, based on the feedback from the students, they still need face-to-face interaction through synchronous

method, since not all students were able to implement self-directed learning. The students still need some element of supervision and one-to-one interaction for better understanding. Even though all materials for teaching and learning were uploaded in the eLEAP page, the lecturer still needs to facilitate and monitor the students closely.

On top of that, the lecturer has made an initiative to create a WhatsApp group as a medium of communication to help the students to understand better. For some students who felt uncomfortable to communicate in the group, they were encouraged to message the lecturer privately to ask questions or discuss on the subject matter. The immersive learning element in this course took place where the students were given the opportunities to undertake their assignment by engaging industry players during MCO. Live instructions and discussions using Microsoft Teams, Zoom, and Webex were conducted which were subsequently followed by reflective conversations in the forum and Padlet provided in the eLEAP page. It is observed that, the students were actively engaged in tasks and projects that are primarily done using blended learning substitution approaches designed for this course during MCO.

Project Rationale

The Movement Control Order (MCO) due to COVID-19 Pandemic has restricted the process of face-to-face teaching and learning delivery in Malaysia. Therefore, the university has taken a proactive approach to encourage all programmes in UNIMAS to implement Blended Learning Substitution. Quantity surveying is a professional programme under the Board of Quantity Surveying Malaysia (BQSM). The issues and challenges are to maintain the quality of teaching and learning during MCO based on certain criteria set by the BQSM. BQSM through special notes, has emphasized on quality of teaching and learning as quantity surveying programme is a hands-on and industry driven programme that requires students to have sufficient skills and knowledge.

The nature of this course (BEQ1073) requires social interaction with industry players which was needed to be conducted online due to the MCO. Various approaches have been taken to ensure the teaching and learning was done successfully. Principally, BEQ1073 is more towards the understanding and application of certain procedure during pre-and construction stage. Certain concept and calculation requires skills and passion to ensure all students received the same understanding when taught online. It is observed that the shift in responsibility by using Student Centred Learning (SCL) has caused the student to struggle in the learning process. They also required a longer time to learn and adapt the processes. Not only that, the students were found to be lacking interest and confidence, and feel discomfort when they work with others. They were afraid to express their ideas and communicate especially using the English language (Unin & Bearing, 2016).

Philosophy of Teaching and Learning

Students Centred Learning (SCL) strategies adapted from Cornelius and Gordon (2008) and Traiantafyllakos et al. (2008) have been incorporated in BEQ1073 course. The two strategies that were chosen are i) flexible learning and ii) learning using technology and software. The flexible learning and learning using technology give students control over their learning. The reason for choosing this learning theory were; firstly due to the MCO and secondly to develop student's ability to think critically and to be able to work in group and individually. Various activities were developed to fulfil the learning units of this course that lead to the achievement of the Course Learning Outcomes (CLO). The activities were designed to encapsulate the course content and fulfil the course objectives. The students' roles primarily would be as project experts while the responsibility of the lecturer was retained as the facilitator and advisor to guarantee the integrity of the course (Wright, 2011).

Approach

Student-Centred-Learning (SCL) is the main approach applied in this course. Several platforms were utilised for Blended Learning Substitution method for this course such as eLEAP, forum, live classroom, and simulations. This course adapted eLEAP as the main platform for teaching and learning activities. All materials for teaching and learning were uploaded in the eLEAP page to enable access for students with poor internet connection. A WhatsApp group was created to complement the learning process and as a medium of communication between lecturer and students. It is also used to facilitate students and to acquire immediate feedback from the lecturers if they faced difficulties in understanding the subject matter.

Based on the students' feedback, synchronous method is also needed because not all students can adapt to SCL. They still need an element of supervision and one-to-one interaction for them to ask questions and get immediate responses from the lecturer. Live instructions and discussion using Microsoft Teams, Zoom, and Webex were conducted which were subsequently followed by reflective conversations in the forum and Padlet provided in the eLEAP page as well as the WhatsApp group.

It is observed that, the students were actively engaged in tasks and projects that are primarily done using blended learning substitution approaches designed for this course.

The implementation of the approach

a) Lecture

A series of instruction were given in the eLEAP page and WhatsApp group. Power point presentations were prepared for the students. Questions were asked in the forum or assignment page available in eLEAP. Feedbacks and insights from students were made compulsory as their attendance were based on their participation in the eLEAP platform. This is to ensure that the students understand the content of the lecture for each learning

unit and be more serious when it comes to teaching and learning. Immediate response from the students' feedback were given in the forum to ensure that the students are heading to the right direction.

b) Tutorial

Tutorial questions were prepared in eLEAP using SCL through simulation of a real project construction. The students need to download the questions and Bills of Quantities for a real project to prepare the Elemental Cost Analysis. Another tutorial question is to download the questions and conceptual drawings of a real project to prepare the Preliminary Detail Abstract. The activities were conducted to achieve the course learning outcomes (CLOs). The instructions and step by step process were explained in eLEAP. However, some students still required further explanation and they have tried to meet the lecturer via Microsoft Team, Zoom or Webex. Some students preferred WhatsApp to ask questions. There are certain concept and complex calculation that the students need to understand before being able to answer the questions. Example of the questions and answers were also provided in eLEAP. Students are required to post their answers in eLEAP, normally on the same day of the lecture. The feedback will be shared during live sessions with all students explaining how the questions were supposed to be answered.

c) Assignment

For the assignment, SCL through Project Based Learning was implemented. The assignment for this course is challenging because it requires data collection and interaction with the construction industry players during MCO. The students were required to divide themselves into eight groups. Each group consisted of six to seven members. The assignment is designed to achieve CLO2 and CLO3. Each group was required to propose a new building construction in Sarawak. Every group needs to search for all cost data from the industry to prepare Preliminary

Detail Abstract (PDA) and Elemental Cost Analysis (ECA) namely tender document, contract document, schedule of rates, tender report, working drawings, and manual for preparing ECA. The information and data were gathered from through e-mail, telephone call, semi-structured interview or any medium of communication with the respective industry. Specific guidelines and rules were explained to students during lecture and other sessions using Microsoft Teams before they embarked on data collection. This includes ethics, communication and listening skills; considering several limitations such as MCO and scattered location of the students. The submission date was set in eLEAP. The feedbacks of the students' assignment were given in class using Microsoft Teams upon students' request. Further questions through WhatsApp, Zoom and Webex were also received from the students from time to time. A rubric was also prepared to facilitate the students on how the marks will be distributed.

Student Centred Learning (SCL) provides meaningful learning experience for the students to think critically and to be able to work individually and in a group. SCL means that the students' roles would be primary as the project experts while retaining the responsibility of the lecturer as the facilitator and advisor to guarantee the integrity of the course (Wright, 2011). The students were expected to be actively involved in learning, managing their own learning processes as well as developing and constructing the knowledge independently. The students were also anticipated to manage and explore with minimum guidance and supervision from the lecturers.

Various approaches such as eLEAP, external tools embedded in eLEAP (padlet, mentimeter), live classroom, SCL through project-based learning and simulation have been adopted and experienced by the students. However, not all students were able to adapt to these approaches because of the nature of the course that required in depth understanding of the concept and complex calculation. Therefore, the task given needed

to be aligned and designed accordingly to give exposure for the students to experience SCL as well as to encapsulate the course content and fulfil the course objectives. The students also needed to be monitored closely from time to time through eLEAP, and other online mechanisms in terms of their feedback and questions to ensure that the learning happens.

Students' Engagement/Involvement

Students' reflections and survey questions in the form of forum and padlet were prepared at the end of every online lecture. Students will drop their questions and queries with regards to the lecture notes, tutorials or assignment given in the space provided. Students were also able to articulate what they have learnt in a different way. They can relate the knowledge that they have gained with not only the lecture notes, but other relevant information available online. This course also provides cognitive (C), psychomotor (P) and affective (A) abilities that can be measured through the tutorial and assignment questions. A rubric for assignment was also prepared and explained to the students so that the students know how the marks will be given and distributed.

As the tutorials and assignment for this course were dealing with the real construction project, project simulation and interaction with the construction industry players, it has definitely strengthened the critical thinking (C), communication and ethics (A) as well as technical skills (P) of the students. Overall, it can be observed that SCL through blended learning substitution has engaged the students in meaningful learning processes and improved their responsibility as they must be independent and self-directed for their own learning.

Students engaged in immersive learning

Many people think that the MCO will limit the students' engagement with the industry. However, as a professional programme, there is a need to interact with the industry players to keep the students updated

with the current issues and information. BEQ1073 is a course that needs an updated cost data for the preparation of Preliminary Detail Abstract (PDA) and Elemental Cost Analysis (ECA). Various strategies have been suggested to students during MCO such as e-mail, telephone call, and semi-structured interview to collect such information. After receiving all the required information, the students will consult the lecturer to get confirmation on the data before they proceed with the assignment. The students were free to ask questions in the forum or eLEAP. All students were able to submit their assignment on time together with all cost data gathered from the industry as evidence.

It is observed that students prefer to ask questions using private message WhatsApp, one-to-one Zoom meeting, Webex, or Microsoft Teams rather than posting the questions openly in the forum or WhatsApp group. One of the reasons is that they need a close interaction and support from the lecturer so that they can be more confident and ready to face the industry players.

The students need to attend the class virtually using asynchronous method in eLEAP according to the timetable set by the faculty. The attendance of the students will only be considered if they have participated in the class activities. Why? It is simply because during MCO, it is hard to monitor the students, whether they have been participating in the class activities or just turn on the laptop and went elsewhere. To ensure active participation, only students who responded in the class activities such as giving feedback on the lecture notes or answers from the tutorial in eLEAP. Once the active participation is observed, the student attendance will be approved. Student will also receive an immediate response from the lecturer regardless of right or wrong answers.

Project simulation in the tutorial on the other hand, requires students to think critically and experience the real construction project. The students will be able to visualise how the projects are designed and estimated. To ensure active learning, students were encouraged to ask questions and provide feedback in the forum or eLEAP.

As for the assignment, students were required to actively engage and communicate with the industry to obtain the updated cost data to further proceed with the preparation of Preliminary Detail Abstract (PDA) and Elemental Cost Analysis (ECA). In this case, the students have control over their own learning and the lecturers' role is to facilitate them so that they are going in the right direction.

Impact on Students' Learning

All CLOs were achieved for this course. SCL through blended learning substitution is a self-directed learning where the students need to be more independent and responsible for their own learning. The overall results shows that 92% passed and 8% failed the final examination. Out of 92%, nine (9) students obtained A, four (4) students obtained A-, 14 students obtained B+, 9 Students obtained B, 6 students obtained B- and 3 students obtained C+. Meanwhile, 1 student obtained D and 3 students obtained F.

The justification of the failure rate is that one of the students did not answer some section of the questions which renders marking impossible for that section. This should not have happened because the student is allowed to refer to lecture notes and other sources of information. The student was also given ample time to answer questions as compared to a traditional exam setting. Plagiarism is a disciplinary issue, 3 students needed to repeat the course as the similarity index were found to be more than 20%. This is based on the integrity form signed by the students and advised by the legal office.

Even though the performance of the students decreased from 100% to 92% as compared to the previous semester, the new approaches such as blended learning substitution, Student Centred Learning (SCL), alternative assessment (take-home examination), project-based learning and simulation of the real construction project have given them added values and new experiences for the students' learning. MCO is not an excuse to stop from learning but the opportunity to transform and improve the learning process.

Improvement Project/Initiative in Future

The skills that are relevant to the course are critical thinking skills (C), technical skills (P), and communication skills (A). These skills were achieved through continuous assessment in form of test and assignment and final assessment in a form of take-home examination. As described earlier, CLO2 is to distinguish the different usage of cost data, cost analysis and appreciate the use of different methods of cost modelling, while CLO3 is to apply the cost planning process in cost control procedure during pre and construction stage. These CLOs have been achieved through continuous assessment and final

assessment. Alternative assessment which is take home examination was introduced to substitute the traditional final examination. Thorough planning of its implementation has been done including construction of critical thinking questions, moderation, preparing Standard Operating Procedure (SOP) before, during and after the take-home-examination, and endorsement at faculty level to ensure its successful implementation.

As for the continuous assessment, both CLOs required students to be self-directed in gathering all information from the industry including tender document, tender report, schedule of rate, contract documents and Elemental Cost Analysis (ECA), with a minimum guidance from the lecturer. The students interacted with industry players to obtain the required information before being able to proceed with the assignment. All tasks and assignment were submitted through eLEAP and graded. Overall, 100% students passed in their continuous assessment and 92% students passed the overall continuous and final assessment.

The Students Centred Learning (SCL) approach through the blended learning substitutions has improved the students' attitude to be more independent and self-directed with minimum supervision and guidance from the lecturer. SCL allows flexible learning by giving students control over their own learning as well as develop student's ability to think critically and to be able to work individually or in a group. Teamwork is very important and challenging for tasks that need to be done in a group especially during MCO where the students stayed at their own

house. The students must communicate with each other using available tools and technologies such as WhatsApp, Microsoft Teams, e-mail, Zoom and Webex to discuss and distribute the tasks. It can be observed that students are more responsible and self-motivated to complete the tasks given within the period. This is proven by receiving all students' submission on time and complete with all evidence acquired.

To implement SCL in teaching and learning, the instruction and direction to the students must be very clear and the lecturers should allow rooms for the students to ask questions with regards to the subject matter. Medium of communication between students and lecturer must also be flexible and inclusive to enable the learning process that can be materialized regardless the students' level of access (poor or good internet connectivity).

Various activities were developed to fulfil the learning unit of this course that leads to the course learning outcome (CLO) achievement. The elements of communication and ethics for example, were embedded in the assignment as the students were required to deal with the industry to obtain several information. The communication, listening skills, ethics and confidentiality of the documents were explained carefully to the students before meeting the industry players enabling a good image portrayal of the institution.

Related Learning Outcome Clusters MQF 2.0; Cluster 2/3A/3B/3C/5

This course is mapped to 3 clusters under MQF 2.0 namely MQF1 (Knowledge and Understanding), 3A (Practical skills) and 2 (Cognitive skills).

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Keywords

Blended-learning substitution, eLEAP, Immersive learning, Self-directed learning, Student-centred learning

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